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ermSF, a ribosomal RNA adenine N6-methyltransferase gene from Streptomyces fradiae, confers MLS (macrolide-lincosamide-streptogramin B) resistance to E. coli when it is expressed.

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The Erm family of methyltransferases confers the MLS antibiotic resistance to pathogenic microorganism through the mono- or dimethylation of a single adenine residue in 23S rRNA, which is known as the target site for modification. One of the erm genes, ermSF was cloned from Streptomyces fradiae NRRL 2702 by PCR and overexpressed in E. coli BL21(DE3) as both a soluble protein and insoluble aggregate (inclusion body) using the T7 promoter driven expression vector, pET23b. Even though most of the overexpressed protein existed as an inclusion body, E. coli cells showed resistance to erythromycin. The lowering of incubation temperature from 37 degrees C to 22 degrees C facilitated the purification of the protein by increasing the fraction of soluble protein. The soluble protein was purified using immobilized metal ion (Ni2+) affinity chromatography in a one-step manner to the apparent homogeneity. The 23S rRNA of E. coli was found to be a good substrate for the purified ErmSF.

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